Abstract of the Disclosure

The subject invention concerns materials and methods for controlling agricultural traits in plants that are mediated by the plant hormone ethylene. One aspect of the invention concerns a polynucleotide that comprises a sequence encoding a mutant ethylene receptor that is operably linked to a regulatory sequence that drives expression of the mutant receptor in a tissue-specific manner. In an exemplified embodiment, the mutant receptor sequence is an etr1-1 sequence, or a functional fragment or variant thereof, and the regulatory sequence is a promoter sequence from a cotton chitinase gene that can promote expression of the mutant ethylene receptor in abscission zone tissue of a plant. The subject invention also concerns plants and plant tissue transformed with the polynucleotide of the subject invention. Plants expressing the polynucleotide of the subject invention do not drop their flowers in response to exposure to ethylene.